

Opportunities in Manufacturing



We make the world.

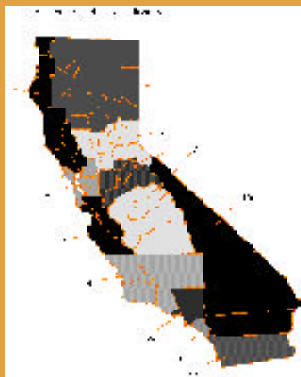
We are the creators, the builders, the inventors.



We take basic stuff and make neat stuff from it. All the things that let you sleep on a bed rather than the floor; in a house rather than outside; with sheets and pillows and blankets and jammies and teddy bears, and controlled warmth. We create your cars and process your food and make it possible

for you to tell time even when the sun's not out. We help you look good, and smell good, and feel good. We bring information and entertainment to you in visual, audio, and written form. We give you choices for how you ski down the slopes, or climb mountains.





About this Publication: This is one of a series of publications developed to aid students and their guidance counselors with career decisions. The current series explores five industries: Health Services; Arts, Media, and Entertainment; Hospitality, Tourism, and Recreation; Information Technology; and Manufacturing.

The series is developed by the Employment Development Department's (EDD) Labor Market Information Division (LMID) California Cooperative Occupational Information System (CCOIS) for California's School-to-Career (STC) system.

The California STC Interagency Partners are: the California Department of Education, the Chancellor's Office of California Community Colleges, and the Employment Development Department.

For each industry, there is a statewide report and a report for each of the twelve California School-To-Career regions in order to provide information unique to the different areas. The twelve STC regions are:

- Region 1: Del Norte, Humboldt, Lake, Mendocino, and Sonoma Counties
- Region 2: Butte, Glenn, Lassen, Modoc, Plumas, Shasta, Siskiyou, Tehama, and Trinity Counties
- Region 3: Alpine, Colusa, El Dorado, Nevada, Placer, Sacramento, Sierra, Sutter, Yolo, and Yuba Counties
- Region 4: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Solano Counties
- Region 5: Monterey, San Benito, Santa Clara, and Santa Cruz Counties
- Region 6: Amador, Calaveras, San Joaquin, Stanislaus, and Tuolumne Counties
- Region 7: Fresno, Kings, Madera, Mariposa, Merced, and Tulare Counties
- Region 8A: Los Angeles County
- Region 8B: Kern, San Luis Obispo, Santa Barbara, and Ventura Counties
- Region 9A: Imperial and San Diego Counties
- Region 9B: Orange County
- Region 10: Inyo, Mono, Riverside, and San Bernardino Counties

For more information on the California Career Opportunities publications, call (916) 262-2162.

Statewide

Opportunities in Manufacturing



We make the stuff of your life.

We have to plan how we're going to do all this, what procedures we'll follow, how many steps it'll take to do it well and efficiently, how we'll get it from us to you, how long it'll take. We have to make sure you want it. Then we have to beat the competition. We have to maintain the right supply in relation to your demand.

We have to determine a lot of costs: raw materials, transportation, machinery, labor, energy, packaging, marketing, "overhead." And that big intangible, the cost of ideas, and more ideas, and then some more.

We are there, at the beginning. . . and until the end.

Or until we no longer need material goods. . .

In California, we *makers of the world* export about a fifth of the nation's computers, electronics, instruments, and food products. While other industries are growing at greater rates, we are one of the largest, with 13% of total California jobs.

California makers have responded dynamically to new frontiers throughout California's history. Not long ago, it was the aerospace industry. Today, it's computers and electronics, to cite a couple, as shown by the growth rates below.



Workplace Size & Expected Growth

<i>In California</i>	<i>Employees</i>	<i>% of Total</i>	<i>% Growth</i> <i>Next 10 Years</i>
Total Manufacturing Workforce	1,537,535	100	20
Printing & Publishing	147,108	10	7
Food	174,143	11	12
Miscellaneous	41,750	3	32
Industrial Machinery	112,437	7	29
Computer & Office Equipment	85,514	6	28
Other Electronic Equipment	226,527	15	34
Transportation Equipment	163,654	11	10
Instruments	164,419	11	19
Chemicals	67,175	4	18
Industrial Material	354,808	23	18



See the Employment Development Department's Labor Market Information Web site www.calmis.ca.gov for more information.

So you think you want to make the world. . .

It can be a lot of fun! But remember, different things excite different people. Think first about what kinds of things you enjoy doing, what kinds of things you're praised for, what kinds of things you'd do even if no one in the world praised you for them.

Do you find yourself trying to make things work better? Do you like to tinker? If you're pretty sure you'd like to make things, use the Internet to study project management, production management, and product development systems. Do they sound like 'naturals' to you,

like really interesting processes? Do you like to bring together a lot of different elements into a creative whole? Does analysis of operations fascinate you? Would you work alone? In groups? Teams? Are people skills important? Is the work fast-paced?

Would you like the working conditions (which can vary a lot)? Are the hours regular? What's the pay range? Are you able to advance in your career without a lot of difficulty? Or will you need more training? Can you move easily geographically? Or will you be asked to?

Will you be excited and challenged over the long term?



Me. . . a maker of the world. . .

If you think so, start your serious thinking with the raw material of this project - you. Think about your own skills, knowledge, and abilities. Then think about the skills, knowledge, and abilities required for different jobs in manufacturing. (You'll be looking at these two combinations the rest of your work life.)

Look at your abilities first. The things you do well naturally. Do you enjoy gathering information to answer a question or solve a problem? Or do you enjoy working with, being around, and helping people? Or do you like making things work? Any answers? Take a

look at the chart below. See if you can find some interesting possibilities. Select a few. Go to the Internet and do a search (a great place to start is the Bureau of Labor Statistics Web site: www.bls.gov/ocohome.htm). Write down what you've learned and what you'd still like to

know. Seek out two or three people who work in the occupation and get a first hand description of what their lives are like and how they got to where they are.

And ask your guidance counselor how you can get involved in Job Shadowing and Mentoring programs.

Which Manufacturing Jobs Would You Want?

If You Like Working Primarily with...

**Required
Years of
Training:**

Less than
2 Years

Information?

- Accounting Clerks
- Adjustment Clerks
- Advertising Clerks
- Billing, Cost & Rate Clerks
- General Office Clerks
- Secretaries
- Shipping, Receiving, & Traffic Clerks

People?

- Order Clerks
- Receptionists

Things?

- Bookbinders
- Food Batchmakers
- Cutters & Trimmers
- Handworkers, including Packers, Assemblers & Fabricators
- Operators & Tenders of Plastic Molding & Casting, Tool Cutting, Metal & Plastic Forming, & Packaging & Filling Machines
- Production Inspectors, Testers, Graders, Sorters, Samplers, & Weighers

2 Years

- Production, Planning, & Expediting Clerks
- Purchasing Agents

- Administrative Assistants
- Blue Collar Worker Supervisors
- Human Resources Technicians

4 or More
Years

- Accountants & Auditors
- Administrative Services Managers
- Economists & Marketing Research Analysts & Planners
- Electrical & Electronic Engineers
- Financial Managers & Planners
- General Managers & Top Executives
- Industrial Engineers
- Industrial Production Managers
- Integrated Circuit Layout Designers
- Management Analysts
- Operations & Systems Researchers & Analysts

- Personnel, Training & Labor Relations Managers

- Assemblers of Precision Electrical & Electronic Equipment
- Bakers (Manufacturing)
- Biological & Agricultural Technologists
- Chemical Plant & System Operators
- Chemical, Electronics Engineering, & Food Science Technicians
- Machinists
- Metal Fabricators of Structural Metal Products
- Petroleum Pump System Operators
- Precision Devices Inspectors & Testers

Note: All jobs require working with things. For most professional jobs, however, using information effectively or interacting with people are more important job requirements.

Sounds like I could work my way up.

You could. But the more knowledge and education you can get up front, the greater your options.

Corporations compete heavily for people with Masters of Business Administration (MBA), which means that you'll be competing with MBAs, too. Many MBAs start off with high salaries and other incentives. Meanwhile, you'll be working a line somewhere doing the

"things" of the previous chart, for laborers' wages. You'll watch these MBAs rotate through your section for short term "experiential training" that focuses on giving them a strong "information base" about the business. Manufacturers want individuals who have a good

grounding in the theory of business and management systems. Then they train them in their own systems. Consider the prior chart carefully when deciding where you'd like to start your career in manufacturing.

Where do I get trained?

As the chart below shows, there are a lot of places to get general training and education in California.

The regional publication in this series gives the number of schools in your area that offer programs geared toward the manufacturing industry. If you want to pursue an MBA, do an Internet search (we used "California MBA" and found programs all over the state). And check the Web sites below for providers of more manufacturing training.



California Schools		
Type of School		Number of Schools
4-Year College level & above		335
2-Year, Technical & Community Colleges		231
Private Business & Technical Schools, Public Adult Schools with Occupational Programs		1,728
Public Secondary, Job Training Partnership, Apprenticeship, Regional Occupational Programs, Other		386
For more information, visit these Web sites:		
• Enhanced State Training Inventory links to training programs throughout California		www.soicc.ca.gov
• America's Career InfoNet links to a lot of state information including California Colleges and Universities		www.acinet.org/acinet

Raw materials (abilities) refined (education) = . . .

Take your abilities and your knowledge and apply them to the job. That's skill development, something you'll be doing for the rest of your life.

What kinds of skills are important to manufacturing jobs? The list below should give you something to think about. How would you combine your natural abilities with knowledge to get better and better at these skills?

Important Skills for EVERYONE in Manufacturing: Communication is key.

Active Listening	Listening to what other people are saying and asking questions that are appropriate
Speaking	Talking to others to convey information effectively
Service Orientation	Actively looking for ways to help people
Problem Identification	Identifying the nature of the problem
Coordination	Adjusting actions in relation to others' actions
Social Perceptiveness	Being aware of others' reactions and understanding why they react the way they do

Important Skills for ENTRY LEVEL Jobs: Attention to detail is key.

Equipment Selection	Determining the kind of tools and equipment needed to do a job
Mathematics	Using mathematics to solve problems
Writing	Communicating effectively with others in writing as indicated by the needs of the audience
Product Inspection	Inspecting and evaluating the quality of products

Important Skills for TECHNICAL Jobs: A higher level of attention to detail is key.

Information Gathering	Knowing how to find information and identifying essential information
Mathematics	Using mathematics to solve problems
Writing	Communicating effectively with others in writing as indicated by the needs of the audience
Reading Comprehension	Understanding written sentences and paragraphs in work related documents

Important Skills for PROFESSIONAL Jobs: Creative planning and effective execution are key.

Implementation Planning	Developing approaches for implementing an idea
Instructing	Teaching others how to do something
Management of Personnel Resources	Motivating, developing, and directing people as they work, identifying the best people for the job
Monitoring	Assessing how well one is doing when learning or doing something

Can I find a job easily?

Will I be secure?

Does it pay well?

Finding a job easily and job security are usually tied to how hard it is for employers to find good employees. The table below shows that employers find it more difficult for some jobs. That affects income.

Generally, income level is tied to training and education. Few industries show this as clearly as manufacturing, at least when you're starting off. MBAs from name schools regularly start work with compensation packages above \$100,000. (If you specialize in Consulting, you're likely to get more.) Those from less well-known schools start in the \$75-85,000 range. Persons with bachelors degrees start for about half that. (Check it out for yourself with an Internet search – we used "MBA salaries".)

It may pay to research the segment of manufacturing you're interested in. Of the 19 subgroups in this industry, 4 show average annual wages 25 percent below the state's average for all industries of \$32,000, while 6 have average annual wages almost 50 percent higher than the state's average. A great place to start your research is the California Trade and Commerce Agency Web site: www.commerce.ca.gov.

Wages, Benefits, & Demand for Selected Manufacturing Jobs

California Jobs	Median Hourly Wages			Benefits ¹		Demand ²	
	New Inexperienced	New Experienced	3 Years with Firm	Full Time	Part Time	Experienced	Inexperienced
Entry Level	\$	\$	\$	%	%	%	%
Assemblers/Fabricators	6.00	7.00	9.24	50+	3+	70	40
Industrial Truck & Tractor Operators	12.00	12.00	14.00	70+	3	40	32
Production Inspectors, Testers, Graders, Sorters, Samplers, & Weighers	7.75	8.50	11.00	50+	5+	80	60
Traffic, Shipping, & Receiving Clerks	6.50	7.50	9.74	65+	5+	45	40
Technical Level							
Biological & Agricultural Technicians	11.50	12.37	15.00	80+	5	28	35
Machinists	7.00	12.00	15.00	45+	3+	80	56
Offset Lithographic Press Setters & Set-Up Operators	8.00	11.00	15.00	50	3	62	65
Precision Assemblers of Electrical & Electronic Equipment	7.00	9.00	12.00	65+	10+	40	30
Printing Press Machine Operators & Tenders	7.00	10.76	14.00	55+	3	83	63
Production, Planning, & Expediting Clerks	8.00	10.00	13.00	65+	3+	50	46
Welders & Cutters	7.00	10.00	12.05	30+	3	70	60
Profession Level							
Industrial Engineers	15.34	20.66	24.07	95+	0	58	25
Industrial Production Managers	10.46	14.51	18.75	75+	3+	80	68
Quality Assurance Managers	N/A	27.70	30.19	100	0	87	50
Software Engineers	19.18	23.97	31.16	90+	10+	99	55

1) Benefits: Percent of employers offering Medical, Dental, Sick Leave, and Vacation benefits.

2) Demand: Percent of employers saying they have a somewhat or very difficult time finding candidates.

Are there any jobs in this neck of the woods?

Should be, if the number of employers is any indication. The table below shows the number of California employers in some key manufacturing subgroups. Check the regional publication in this series to find out how many there are in your county.

Here are a few ways to find out who's hiring:

- Use your local resources for leads. If you've been preparing yourself locally, then you probably already know who they are, through prior contacts. Visit these people and ask their advice. They'll normally be happy to help guide a potential future colleague.
- Follow the local business pages and periodicals found in libraries and bookstores to get the names, addresses, and phone numbers of potential employers.
- Explore the Internet. Start with the sites below for a great series of links that'll take you almost anywhere. Or do your own "key word" search if there's an aspect of this industry that you're specially interested in.

Plan well, and good fortune to you!

California Employers

<i>Workplace</i>	<i>Number of Employers</i>
Total Manufacturing	42,857
Printing & Publishing	7,839
Food	3,062
Miscellaneous	2,259
Industrial Machinery	6,601
Computer & Office Equipment	838
Other Electronic Equipment	4,061
Transportation Equipment	2,147
Instruments	2,507
Chemicals	1,558
Industrial Material	11,985



For more information, visit these Web sites:

California Occupational Information Coordinating
Committee links to many resources

www.soicc.ca.gov

Employment Development Department links
to STC, CalIOBS, and America's Job Bank

www.edd.ca.gov

The California Trade and Commerce Agency
Industry Background

www.commerce.ca.gov/california/economy/profiles



About the Data: Industries in this and other Career Opportunities publications reflect the California Department of Education's selection of Standard Industrial Classifications (SIC) that

would provide the best overall picture of an industry to students, guidance counselors, and parents. Some classifications have been assigned to more than one "industry group" because the classifications have direct relevance to more than one "industry." For example, data for the Manufacturing Printing & Publishing classification are also found in the Arts, Media, & Entertainment publication.

Data are drawn from:

- *Workplace Size and Expected Growth* (page 2) and *California Employers* (page 8): the Employment Development Department (EDD) Labor Market Information Division (LMID) Covered Employment and Wages Program (ES 202). Counts and percentages are from the 3^d Quarter of 1997. Projections of Growth are from 1995 ES 202 Data. Percentages may not add to 100 due to rounding.
- *Which Manufacturing Jobs Would You Want* (page 4) and the information regarding skills: Dictionary of Occupational Titles (DOT), Occupational Information Network (O*NET), and the Department of Labor.
- *California Schools* (page 5): the Enhanced State Training Inventory. Counts are approximate and include multiple sites of the same provider.
- *Wages, Benefits, and Demand for Selected Manufacturing Jobs* (page 7): EDD LMID California Cooperative Occupational Information System (CCOIS) Occupational Summaries, 1995-1997. Wages for jobs having union and non-union employees are reported for whichever of the two show higher wage levels. In many cases, however, the differences between union and non-union wages are small. Wages reflect periods having different minimum wages. A median wage is the middle point in a range of wages.



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